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Pseudocercospora picrasmicola sp. nov. and a new record of *P. paludicola* from China

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Abstract — *Pseudocercospora picrasmicola* on *Picrasma quassioides* is introduced as a new species, based on Chinese specimens previously misdetermined as "*Prathigada picrasmae*." *Pseudocercospora paludicola* on *Persicaria chinensis* is reported as new to China. The two species are described, illustrated, and discussed. Examined specimens are deposited in the Herbarium of the Institute of Microbiology, Chinese Academy of Sciences, Beijing (HMAS).

Key words — anamorphic fungi, *Passalora*, *Cercospora*, *Polygonum,* taxonomy

Introduction

In this study we reassess *Prathigada picrasmae* (Togashi & Katsuki) X.J. Liu & Y.Z. Liao. The thin inconspicuous conidiogenous loci of the Chinese material on which Liu & Liao (1980) based this new combination conform with *Pseudocercospora* Speg., and the Chinese fungus is not conspecific with the Japanese *Cercospora picrasmae* Togashi & Katsuki. Thus "*Prathigada picrasmae*" sensu Liu & Liao (1980) is a misapplied name, and this taxon is described here as a new species, *Pseudocercospora picrasmicola*, with the original specimen of Liu & Liao (1980) as holotype and an additional specimen identified by Guo (1996) as a paratype.

A cercosporoid fungus found on *Persicaria chinensis*, identified as *Pseudocercospora paludicola*, represents a new record for China.

Materials & methods

Type material of the new species was collected on living leaves of *Picrasma quassioides* in Taibai Mountain, Shaanxi Province; additional material was collected on the same host in Liuba, Shaanxi Province. *Pseudocercospora paludicola* was found on leaves of *Persicaria chinensis* in Kuankuoshui protection zone, Guizhou Province. Samples from the three collections were mounted in distilled water and examined using oil immersion (bright field and phase contrast) with an Olympus CX 21 light microscope. Thirty measurements (400× magnification) were made of conidia and other structures. All specimens are deposited at the Mycological Herbarium of Academia Sinica (HMAS), Beijing.

Taxonomy

Pseudocercospora picrasmicola Y.L. Guo, F.Y. Zhai & Ying J. Liu, **sp. nov.** Fig. 1

MycoBank MB 810159

Differs from other *Pseudocercospora* spp. on simaroubaceous hosts by its rostrate conidia with unequally colored cells and thick-walled septa.

Type: China, Shaanxi Province, Taibai Mountain, on leaves of *Picrasma quassioides* (D. Don) Benn. (*Simaroubaceae*), 13 X 1963, coll. Q.M. Ma & Y.C. Zong (**Holotype**, HMAS 10266).

Misapplied name: "*Prathigada picrasmae*" sensu Liu & Liao (1980).

Etymology: referring to the host genus *Prasmicola*.

Leaf spots amphigenous, subcircular, 1–3 mm diam., often confluent, grayish white to pale brown, margin surrounded by a brown to dark brown line, with an olivaceous-brown to pale brown halo on the upper surface, on the lower surface angular, margin indistinct, limited by veins, 1–4 mm wide. Caespituli hypogenous. Mycelium internal. Stromata subepidermal, globose, dark brown, 25–40 µm diam. Conidiophores loosely to densely fasciculate, olivaceous to pale olivaceous-brown, uniform in color, irregular in width, straight to curved, not branched, 0–1-geniculate, thick-walled, smooth, rounded to conical or conically truncate at the apex, 1–3-septate, 13–50(–75) × 4.0–5.8 µm. Conidiogenous cells integrated, terminal, 10–25 µm long. Conidiogenous loci inconspicuous, thin, planate, 2–3 µm wide. Conidia solitary, obclavate, rostrate, pale olivaceous-brown to moderately dark olivaceous-brown with cells unequally colored, thick-walled, smooth, straight to curved, obtuse at the apex, obconically truncate at the base, 2.4–4.0 µm wide, 3–11-septate, septa rather thick and dark, sometimes constricted at the septa, 45–95(–128) × 4.7–8.0(–9.3) µm.

Additional collection examined: **China. Shaanxi Province**, Liuba, on leaves of *Picrasma quassioides*, 20 IX 1991, coll. Y.L. Guo 2072 (HMAS 69480).

Notes: Togashi & Katsuki (1952) described *Cercospora picrasmae* on *Picrasma quassioides* [= *P. ailanthoides* (Bunge) Planch.] from Japan as:

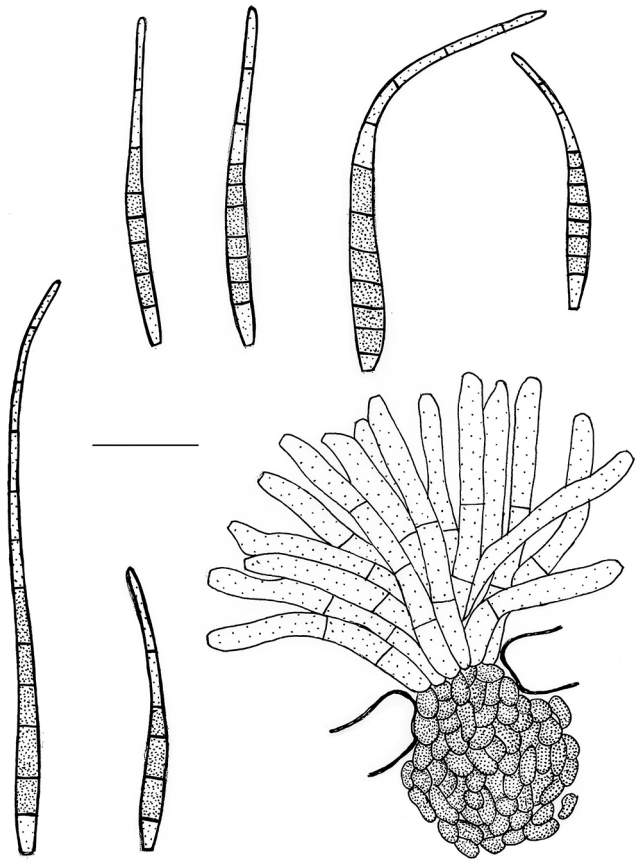

Fig. 1. *Pseudocercospora picrasmicola* (holotype, HMAS 10266). Conidiophores and conidia. Scale bar = 10 μm.

> "leaf spots 0.5–3.0 mm diam.; fruiting hypophyllous; stromata globose, brown, 15.0–50.0 μm diam.; conidiophores very pale olivaceous-brown, aseptate, without geniculate point, 15.0–43.0 × 3.4–5.0 μm; conidia obclavate, pale olivaceous, 2–7-septate, 25.0–85.0 × 4.0–5.5 μm."

Liu & Liao (1980) studied a Chinese cercosporoid specimen on the same host, and in spite of significant morphological differences this collection was identified as *Cercospora picrasmae*. Type material of this species was not available for comparison; but based on their Chinese material having conidia

with unequally colored cells and long beaks, Liu & Liao (1980) transferred *C. picrasmae* to *Prathigada*. However, the conspecificity of the Chinese *Prathigada*-like fungus and authentic Japanese *C. picrasmae* is untenable and based on a misinterpretation of the Japanese *Cercospora* species, which is morphologically quite distinct in its aseptate conidiophores and uniformly pale olivaceous and much narrower conidia without beaks. Re-examination of type material and additional Japanese collections is necessary to elucidate the genuine generic affinity of *C. picrasmae,* which is tentatively retained in *Cercospora*.

There are only a few other *Pseudocercospora* spp. on hosts belonging to the *Simaroubaceae*, but their conidia are not rostrate, lack unequally colored cells, and have thin-walled septa.

Pseudocercospora ailanthicola (Patw.) Deighton on *Ailanthus excelsa* Roxb. differs from *P. picrasmicola* in forming indistinct leaf spots, lacking stromata, and in producing smaller (26.5–39.5 × 3–4.5 µm) pale brown conidiophores with 3–4 conspicuous scars and much smaller (20–63 × 3–5 µm) olivaceous to pale brown conidia that gradually narrow towards the apex (Patwardhan 1963). Another species described from *A. excelsa*, *P. ailanthigena* H.S.G. Rao et al., is conspecific with *P. ailanthicola* (Kamal 2010).

Pseudocercospora qinlingensis Y.L. Guo parasitizing *Ailanthus* sp. differs from *P. picrasmicola* in possessing amphigenous fruiting, larger stromata (40–100 µm), shorter conidiophores (6.5–26 × 3.9–6 µm), and cylindrical, darker (olivaceous-brown to moderate brown) conidia that are uniformly colored, strongly curved, and slightly longer and narrower (32–150 × 4–7.6 µm; Guo 1996).

Pseudocercospora simaroubae U. Braun & F.O. Freire on *Simarouba versicolor* A. St.-Hil. differs from *P. picrasmicola* in lacking or producing only small stromata, occasionally forming branched, broader (3–7 µm), (0–)1–6-septate conidiophores with 10–25 µm long conidiogenous cells and inconspicuous to sub-conspicuous conidiogenous loci, and obclavate to cylindrical and smaller (15–60 × 3–7 µm) conidia with 1–8 septa; Braun & Freire 2003).

Pseudocercospora paludicola (Speg.) U. Braun, Schlechtendalia 5: 67, 2000. Fig. 2
≡ *Cercospora paludicola* Speg., Anales Soc. Ci. Argent. 13: 29, 1882.

Leaf spots amphigenous, angular to irregular, 1–4 mm diam., margin indistinct, often confluent, brown to dark brown, with yellowish to pale brown halo on the upper surface, paler on the lower surface. Caespituli hypogenous. Primary mycelium internal. Secondary mycelium external, hyphae emerging through stomata, pale olivaceous to olivaceous, branched, septate, 1.3–2.5 µm wide. Stromata none or small, substomatal, dark brown.

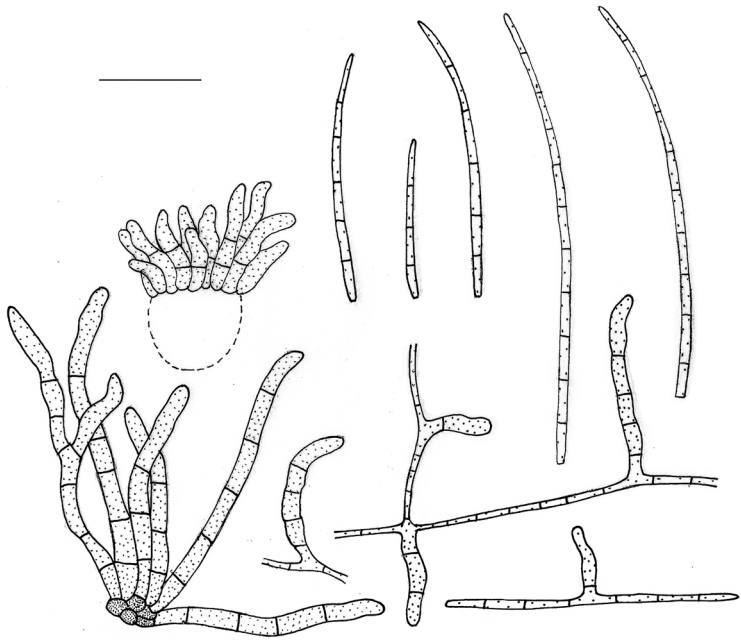

Fig. 2. *Pseudocercospora paludicola* (HMAS 244890).
Conidiophores and conidia. Scale bar = 20 μm.

Conidiophores emerging through stomata, densely fasciculate or solitary, arising from external hyphae as lateral branches, pale olivaceous-brown, uniform in color, thin-walled, smooth, irregular in width, straight to slightly curved, branched, slightly geniculate, rounded to conical at the apex, 1–7-septate, constricted at the septa, 10–80 × 2.5–5 μm. Conidiogenous cells terminal, 6–19 × 1.8–4.4 μm. Conidiogenous loci inconspicuous. Conidia solitary, cylindrical, pale olivaceous to olivaceous, thin-walled, smooth, straight to curved, obtuse at the apex, obconically truncate and 1.2–1.6 μm wide at the base, 3–10-septate, 35–125 × 2.5–3.7 μm.

Collection examined: **China**. **Guizhou Province**, Kuankuoshui protection zone, on leaves of *Persicaria chinensis* (L.) H. Gross, 16 IX 2013, coll. Y.L. Guo 73 (HMAS 244890).

Notes: This is the first report of *P. paludicola* (previously known only from Argentina) from China. Guo (1993) identified a fungus on *Polygonum aviculare* L. (HMAS 65900) from Xiao Wutai Mountain, Hebei Province, with thickened conidiogenous loci and pigmented conidia as *Cercospora paludicola*, based on Chupp's (1954) description of this species. Braun (2000), who

examined the Argentinian type specimen of *C. paludicola*, found unthickened and unpigmented conidiogenous loci and hila and transferred the species to *Pseudocercospora*. After Guo & Li (2002) re-examined the Chinese fungus on *Polygonum aviculare,* they described it as a new species, *Passalora polygoni* Y.L. Guo.

In contrast to *Passalora polygoni*, our Chinese collection on *Persicaria chinensis* represents a genuine *Pseudocercospora* species, morphologically very similar to Spegazzini's (1882) description of *C. paludicola* (conidiophores 5–25 × 2–3.5 µm, conidia 30–150 × 2–3.5 µm), only differing in having longer conidiophores and somewhat shorter conidia.

Two other *Pseudocercospora* species, *P. persicariae* (W. Yamam.) Deighton on *Polygonum* and *Persicaria* spp., and *P. polygonicola* (A.K. Kar & M. Mandal) Deighton on *Polygonum* spp. are somewhat similar to *P. paludicola*, but they do not form angular leaf spots, they lack superficial hyphae, and their conidia are broader and mainly obclavate (Chupp 1954; Kar & Mandel 1969).

Acknowledgments

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